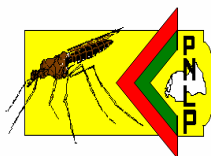


REPUBLIC OF RWANDA



MINISTRY OF HEALTH
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**THE NEW THERAPEUTIC APPROACH TO MALARIA
TREATMENT IN RWANDA**



National Malaria Control Program

I.MANAGEMENT OF UNCOMPLICATED MALARIA

In families

- Reinforcement of I.E.C measures creating by awareness of the signs of uncomplicated and complicated malaria by family members and the application of all preventive measures especially insecticide impregnated bed nets.
- Management is principally prompt consultation to the nearest health centre but temperature should be reduced by tepid sponging.

In communities

The role of public health worker is to:

- Sensitise the population on the awareness of the signs of simple and severe malaria.
- Orient the population to rapid consultation of health centres.
- Sensitise the population about the use of insecticide impregnated bed nets

In Health centres

- It is advisable to give the first line drugs after taking a blood smear.
- First line drugs are; amodiaquine (AQ) 200mg by taking a single daily dose of 10mg/kg/day for three consecutive days (not exceeding 600mg per day) and Sulfadoxine pyrimethamine (SP) by taking a single dose of 25mg/kg/day of sulfadoxine or one tablet per 20kg body weight.
- Not exceeding three tablets of 525mg of SP for an adult.
- The two drugs are taken at the same time on the first day.
- If no improvement in the first 72hrs, verify if the drugs were taken correctly, examine the patient and take a blood smear. If the blood smear is **positive**, change to quinine per os by giving 30mg/kg body weight/day in three divided doses for 7 days. If the blood smear is **negative**, look for other causes. If signs persist besides a negative blood smear treat (with quinine per os) as uncomplicated malaria and classify as uncomplicated malaria probable.
- In case of contraindications (to the drugs mentioned above) like allergy to sulfamides, in severe hepatitis or renal failure and to children below 2 months

of age, the first line drug is quinine per os by taking 30mg/kg body weight/day in 3 divided doses for seven days.

- It is a must to take a blood smear before giving quinine.

NB: If fever persists after 48 hours of quinine therapy, look for other pathologies associated.

II.MANAGEMENT OF SEVERE MALARIA

➤ Minimum requirements for the management of severe malaria in a health centre.

1. Trained personnel
2. Presence of a constant clinical and para clinical follow up system 24 hours a day
3. A laboratory able to do a blood smear, measure the haemoglobin, haematocrit and glycemia levels.
4. Able to do a urine exam for presence of sugar for adults (to eliminate diabetes) and proteinuria (to eliminate pregnancy induced hypertension or pe-eclampsia)
5. Able to do a lumbar puncture.
6. Able to transfuse in case of severe anemia

➤ If a health centre does not fulfil the above conditions they should:

- ❑ Make a clinical diagnosis.
- ❑ Do a thick smear and thin smear if possible.
- ❑ Give the following treatment before transferring:

Urgently give quinine IM in a dose of 20mg/kg body weight divided into two and each half injected on each thigh. (not exceeding 1200mg).

Quinine is diluted in the following format: add 4ml of distilled water or physiologic saline to 2ml(600mg) of quinine to get a solution of 100mg/ml (4ml of water+2ml of quinine=6ml corresponding to 100mg/ml).

Symptomatic treatment if necessary will be given as follows:

- **If temperature is above or equal to 38.5°C**
 - Tepid sponging
 - Paracetamol 15mg/kg per os or Novalgin IM in the dose of 1g (2ml) for adults and 0.01 to 0.02 ml/kg for children if oral administration is impossible.
- **Prevention of hypoglycaemia:**
 - Administration of glucose 10% per os or by nasogastric tube in the dose of 5ml/kg for children and 50 – 100ml for adults. Glucose 10% is prepared in this format: To obtain 100ml of 10% glucose; add 10 g (or 2 tea spoon full) of sugar to 100ml of clean water.
- **In case of convulsions:**
 - Give diazepam in the dose of 0.5mg/kg body weight intrarectally for children and 10mg by IV for adults.
 - Prevent hypoglycaemia
 - Treat fever if necessary

Then transfer the patient to the nearest hospital with the information of what has been clinically done and the blood smear.

District hospital and private hospital

- ❑ It is the first level for the management of severe malaria
- ❑ Quinine is the drug of choice

For children and adults

Administer quinine with a loading dose of 20 mg/Kg body weight in 5-10 ml/Kg body weight intravenous fluids with normal saline or 5-10% glucose. The infusion should last 4 hours (do not exceed 1200 mg). Then install a 5-10% glucose perfusion over 8 hours. Twelve hours after start of the loading dose, administer a maintenance dose of quinine, 10 mg/Kg which should also last for 4 hours. This maintenance dose should be repeated every after 12 hours, calculated from the beginning of the previous Quinine infusion, until the patient can accept per os.

Give quinine orally as soon as possible with a dose of 30 mg/Kg of body weight three times daily to complete the dose for 7 days.

NB: The loading dose should not be given if the patient had received a correct dose of quinine in the past 12 hours or Mefloquin in the past 7 days.

□ **Symptomatic treatment**

The following associated complications require special attention:

1. Hyperpyrexia

Paracetamol tablets should be given orally with a dose of 15 mg/Kg of body weight repeatable 4 times daily.

This drug is available in powder form, which should be administered orally, by nasogastric tube, or rectally for a patient who is unable to swallow.

In case the above administration routes are not possible administer intra muscular or IV Novalgine.

2. Convulsions

For children , administer intra rectal Diazepam (0.5 mg/Kg).

Recurrent seizures should be treated with intra muscular Phenobarbital 10-15 mg/Kg.

Diazepam is administered by slow intravenous infusion or rectally with dose of 10 mg for adults. Since Diazepam has side effects, strict monitoring is required when this drug is administered.

3. Severe anaemia

Transfusion should be taken into account when haematocrit for a well hydrated patient falls below 15% or haemoglobin concentration less than 5 g/dl. Full blood is administered with a dose of 20 mg/Kg of body weight. If renal function is normal, small doses of intravenous diuretics (eg.

Frusemide) should be administered during blood transfusion to avoid circulatory overload. Packed red cells are administered with the dose of 10 mg/Kg body weight. For malnourished children, anaemia is corrected with full blood, 10 mg/Kg body weight and it's recommended to prolong the transfusion. For children the dose for Frusemide is 1 mg/Kg body weight. Each blood pack must flow over a 3-4 hours of maximum to avoid the risk

of contamination to the pierced sac. This is recommended for both adults and children.

Adjustment of initial flow rate: **1 ml of full blood corresponds to 20 drops and 1 ml of packed red cells corresponds to 15 drops. To transfuse a blood sac over 3-4 hours, adjust the flow rate to 25-30 drops per minute.**

In case of weak patients (heart failure) ,slow down the transfusion and administer Frusemide.

4. Hypoglycemia

Hypoglycemia must be excluded in all patients presenting with severe Malaria. If hypoglycaemia cannot be excluded by blood test, comatose or very ill adult patients should be given a test dose of 20-50 ml of 50% dextrose intravenously given over 5-10 minutes (1 ml/Kg of 50% glucose for children). However, the routine administration of 50% dextrose to all patient with severe Malaria is not recommended because of rebound hypoglycaemia.

Monitoring of the clinical condition and blood sugar must be continued even if hypoglycaemia is initially controlled and the patient is receiving intravenous glucose.

After controlling the hypoglycaemia, it is advisable to maintain a perfusion of 5-6 ml/Kg of 5% glucose or 3-4 ml/Kg of 10% glucose. The 10% glucose perfusion is obtained from a mixture of 5% and 50% glucose solutions (56ml of G 50% + 444 ml of G 5% = 500ml of G 10%).

5. Respiratory distress

Administer oxygen

Check for severe anaemia, treat heart failure and pulmonary oedema.

6. Coma

- evaluate the depth of coma (Blantyre or EVDI for children, Glasgow or EVDI for adults) regularly (at least twice daily).
- Do lumbar puncture If necessary
- Check glycaemia and treat
- Check temperature and treat

- Treat convulsions
- Place patient in lateral position
- Aspirate if necessary
- Monitor fluid balance
- Change posture at least 4 times daily

7. Renal failure

This condition should be managed in a national referral hospital.

III.MANAGEMENT OF MALARIA DURING PREGNANCY.

1. Management of uncomplicated Malaria

In the community and homes:

- Reinforcement of IEC guidelines for creating awareness and encourage women to consult promptly.
- Community health leaders are the main people for sensitisation towards consultation and application of preventative measures such as treated bed nets.

▪ In health institutions:

Sulfadoxine-Pyrimethamine (SP) is contraindicated during the first trimester of pregnancy. It is hence recommended to use quinine as the first line drug with a dose of 30 mg/Kg body weight (not exceeding 1800 mg) 3 times daily for 7 days.

The association of Sulfadoxine-Pyrimethamine and Amodiaquine is recommended as the first line treatment during the second and third trimester of pregnancy except, in case of contraindications, where quinine is given orally with the dose indicated above.

2. Severe Malaria

Apply the same management like the other different groups at different health levels.

- Quinine is not contraindicated during pregnancy whatever the gestational age.
- Hypoglycaemia is common during pregnancy.
- Check the foetal condition regularly.

IV.LABORATORY DIAGNOSIS

Optical microscopy is used for laboratory diagnosis.

The parasitic density method is reserved for research or particular situations of severe Malaria or in case of therapeutical failure.

An average count of eight thousand (8,000) leukocytes per micro litre is considered and the parasitic density is then calculated as follows:

$$\text{Parasites per micro litre of blood} = \frac{\text{Number of parasites counted} \times 8000}{\text{Number of leukocyte counted}}$$

The following semi-quantitative method expressing results in terms of "plus" (+) signs is recommended for indicating the parasitic count:

+	=1-10 parasites per 100 microscopic fields of blood smear
++	=11-100 parasites for 100 microscopic fields of blood smear
+++	=1-10 parasites per microscopic field of blood smear
++++	=11-100 parasites per microscopic field of blood smear field

This method is recommended both for disease management and quality control.

V.CHEMOPROPHYLAXIS

Reserved only for travellers from Malaria free zones.

For the people concerned, chemoprophylaxis should be started at least one week before the journey, to be maintained during their stay in the Malaria endemic region and continued for 4 weeks after leaving the endemic region (international travellers).

Following are the recommended drugs:

-Mefloquin 250 mg

Prophylactic dose is 250 mg per week for adults and 5 mg/Kg body weight for children.

OR

-Doxycyclin

Prophylactic dose for adults is 100 mg per day.

This drug is contraindicated for children aged less than 8 years and pregnant or breastfeeding women.

Appendix 1

Modified Glasgow coma scale (Blantyre)

		Score
Eyes mouvement :	Adequate (follows mother's face or objects.....	1
	Inadequate.....	0
Verbal response:	Appropriate cry.....	2
	Inappropriate cry.....	1
	None.....	0
Best motor response :	Localises painful stimuli *.....	2
	Removes limb in reaction to pain **..	1
	None specific or absence of response	0

* rubbing knuckles on patient's sternum

** firm pressure on the thumbnail by placing horizontally with pencil.

Add all scores to obtain a total score of the modified Glasgow coma scale.

Appendix 2

Amodiaquine

The table below is based on the total dose of 30 mg/kg over 3 days for tablets containing 200 mg of the chlorhydrate.

WEIGHT (KG)	AGE	NUMBER OF TABLETS (200mg)		
		Day 1	Day 2	Day 3
5-6	2- 4 months	¼ of tablet	¼ of tablet	¼ of tablet
7-10	4-11 months	½ of tablet	½ of tablet	½ of tablet
11-14	1-2 years	¾ of tablet	¾ of tablet	¾ of tablet
15-18	3-4 years	1 tablet	1 tablet	1 tablet
19-24	5-7 ans	1+1/4 tablet	1+1/4 tablet	1+1/4 tablets
25-35	8-10 years	1+ ½ tablet	1+ ½ tablet	1+ ½ tablets
36-50	11-13 years	2 + ½ tablet	2 + ½ tablet	2 + ½ tablets
50+	14 years and above	3 tablets	3 tablets	3 tablets

Appendix 3

Sulfadoxine-Pyriméthamine

Single dose treatment using tablets containing 500 mg Sulfadoxine plus 25 mg Pyrimethamine.

WEIGHT (KG)	AGE	NUMBER TABLETS (525mg) OF
5-6	2-3 months	¼ of tablet
7-10	4-11 months	½ of tablet
11-14	1-2 years	¾ of tablet
15-18	3-4 years	1 tablet
19-29	5-9 years	1+ ½ of tablets
30-39	10-11 years	2 tablets
40-49	12-13 years	2 + ½ of tablets
50+	14 years and above	3 tablets

Appendix 4

Quinine (oral)

The table below is based on a maintenance dose of 10 mg/kg body weight 8 hourly for 7 days using tablets of 300 mg quinine.

AGE (YEARS)	NUMBER OF TABLETS 300MG
< 1 year	¼ of tablet
1-3 years	½ of tablet
4-6 years	½ of tablet
7-11 years	1 tablet
12-15 years	1+ ½ of tablet
15years and above	2 tablets